

ABSTRACT OF THE DISCLOSURE

Rotating devices including actuators and position sensors that
5 employ combdrives are described. One design of a combdrive
fabricated from a single layer is provided such that, in a
nominal state, the two sets of comb fingers are substantially
interdigitated according to a predetermined engagement. A
rotating element may be attached to a rotatable flexure
10 disposed along an axis and coupled to the comb fingers along
with a biasing element attached to the rotating element to
cause the comb fingers along with the rotating element to
undergo a controlled angular displacement from the initial
engagement and in response to feedback from sensing the
15 position of the movable or rotating element. A voltage may be
applied between comb fingers to cause the rotating element to
undergo further rotation about the axis in a predetermined
manner. Alternatively, a time-vary biasing force may be
exerted on the rotating element, causing the first comb fingers
20 along with the rotating element to undergo further rotation
about the axis in a predetermined manner. The combdriven
device can serve as both rotating actuators and position
sensor. By arranging two such combdrives in a gimbaled
structure bi-axial rotating actuators and position sensors may
25 be constructed. The combdrive devices of the present invention
can be employed in a broad range of applications, including
biomedical devices, optical devices for tracking and display,
telecommunication devices such as fiber-optic switches,
inertial sensors, and magnetic disk drives.

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